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ABSTRACT

Three challenges that face distance educators at the national, institute, and individual subject level in Australia are discussed in a set of Occasional Papers by the Riverina-Murray Institute of Higher Education (RMIHE). Australia is undergoing a period of major change. The binary system of universities and colleges of advanced education is ending, and tertiary institutions are under pressure to amalgamate. Some providers of distance education are under threat. The search for ways to make distance education more attractive, effective, and efficient continues. Three papers on the subject are as follows: (1) "A Model for Cooperative Development of Resource Materials and Educational Courseware" (L.J. Barker and J.C. Taylor); (2) "Using Computer Based Communications to Reduce the Difficulties of Distance Education" (T.R. Frost); and (3) "The Introduction of External Master Degrees by Coursework at RMIHE" (D.W. Roberts). (SM)

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NEW CHALLENGES IN DISTANCE EDUCATION

Division of External Studies
Riverina-Murray Institute of Higher Education
Wagga Wagga and Albury

OCCASIONAL PAPERS - NUMBER SEVEN

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EDITORIAL COMMENT

Occasional Papers 7 (New Challenges in Distance Education) is being published at a time when Higher Education in Australia is undergoing a period of major change. The Binary system (Universities and Colleges of Advanced Education) is to be scrapped, tertiary institutions are under pressure to amalgamate and some providers of distance education are under threat.

While the politicians fiddle with the future the everyday business of providing learning materials to external students goes on. The search for ways of making distance education more attractive, effective and efficient continues. Challenges abound.

Occasional Papers 7 examines three such challenges that face distance educators at the National, Institute and individual subject level.

The opening paper "A Model for Cooperative Development of Resource Materials and Educational Courseware" is the outcome of an invitation from the Standing Committee on External Studies of the Commonwealth Tertiary Education Commission (CTEC) to the Australian Committee of Directors and Principals of Colleges of Advanced Education (ACDP) to devise a model for cooperative development between institutions of their resource materials and educational courseware. The project was conducted from the Darling Downs Institute of Advanced Education (DDIAE) during 1986 and 1987 and was published in 1988. It may well be the prototype model for future cooperative ventures between tertiary institutions in Australia that attain Distance Education Centre (DEC) status.

By way of contrast, the second paper by Tim Frost describes an attempt to meet the challenge of improving communication between the lecturer and his students in an external computer applications subject. The paper argues that by utilising computer based electronic communication facilities for both routine communications and assignments a very time responsive and cost effective environment can be provided.

The final paper addresses a number of pedagogical concerns that will arise from the introduction of seven external Master Degrees by coursework at RMIHE over the next year or two. The author believes that Master Degree work necessitates special attention be given to assessment procedures, residential schools, two-way communication systems, library access and instructional design.

Finally, it should be noted that Occasional Papers 7 for the first time includes a paper contributed by two authors who are not directly associated with RMIHE. Editions One to Six consisted only of contributions from RMIHE staff or students thus reflecting the in-house nature of Occasional Papers. As we inevitably move towards greater cooperation between higher education institutions in Australia we can look forward to more outside contributors.

I hope you enjoy Number Seven!

DAVID ROBERTS
EDITOR

NOTES ON AUTHORS

Lindsay Barker is Director of Darling Downs Institute of Advanced Education.

Tim Frost is a lecturer in Computing with the School of Information Studies at RMIHE.

David Roberts is Associate Head of the Division of External Studies at RMIHE.

James Taylor is Head, Division of External and Continuing Education, Darling Downs Institute of Higher Education.

SPECIAL NOTE

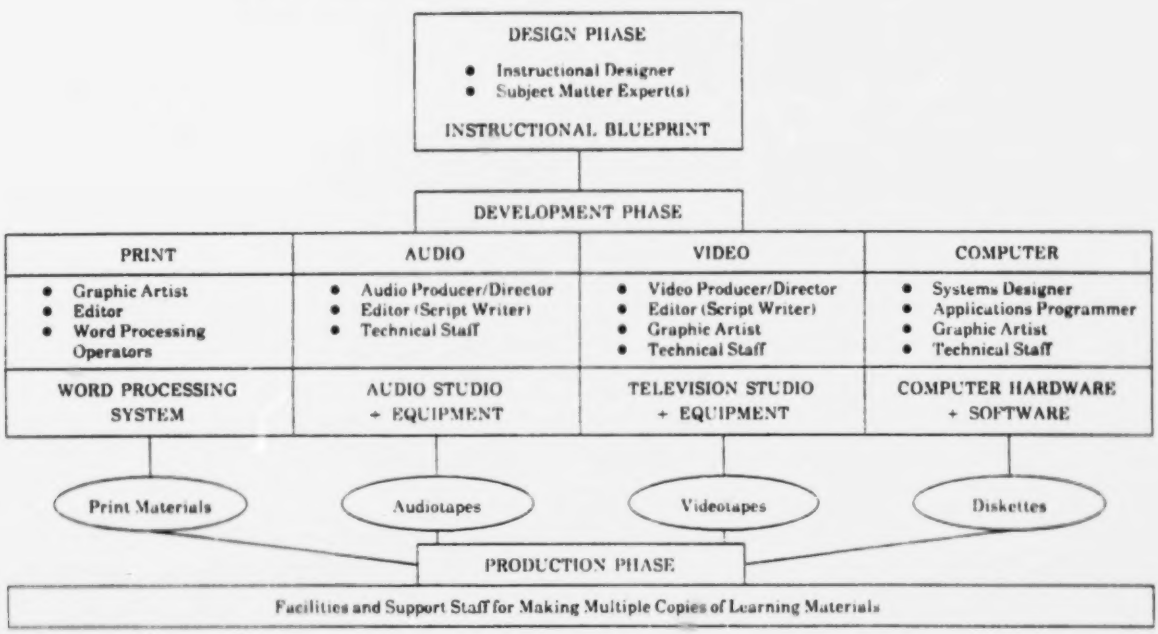
Written permission to reprint the paper, "A Model for Cooperative Development of Resource Materials and Educational Courseware" (Barker and Taylor) was granted by the Department of Employment, Education and Training. The paper was initially a report funded under the evaluations and investigations program of the Department of Employment, Education and Training and published by the Darling Downs Institute of Advanced Education in 1988.

A MODEL FOR COOPERATIVE DEVELOPMENT OF RESOURCE MATERIALS AND EDUCATIONAL COURSEWARE

INTRODUCTION

The aim of all distance education operations must be to provide effective instruction at the lowest possible cost. The production of effective instructional materials tends to depend on a somewhat unusual economic structure reflecting lopsided investment requirements characterised by: high development costs and relatively low delivery and implementation costs. The majority of costs is incurred prior to any student being exposed to the educational process embedded in the materials. Further, in the final analysis, cost-effectiveness is highly dependent on the number of successful students. In turn, the number of successful students will be highly dependent on the quality of instructional materials. Ideally, what is required is a sophisticated infrastructure comprising a professional multi-disciplinary team of experts, working with adequate facilities and equipment according to appropriate timelines. This infrastructure requires a range of expertise to support the instructional design, development and production functions across a range of media. Ideally, the infra-structure should support the development of print-based, audio-based, video-based and computer-based instructional materials as outlined in the following diagram (Figure 1).

Figure 1. Instructional Materials Design Development and Production Infrastructure



It is clear that a major investment is required in personnel, facilities and equipment to support such a sophisticated infrastructure. Apart from expert personnel, a word processing system and printery are required to support the production of written materials; audiovisual studios and equipment are required to support the production of audio and videocassettes; and major investments in hardware and software are required to support computer-based instructional initiatives.

It is apparent that the costs associated with the establishment of such an infrastructure are likely to be beyond many institutions in the formal educational arena, and most certainly beyond many organizations involved with non-formal education. Nevertheless, one of the attractive features of modern distance education is that it frees instruction from time and place through the generation of relatively permanent instructional resources (print materials, audiotapes, videotapes, computer-managed learning packages, etc). The availability of such teaching resources can contribute to economies of scale, reducing per student costs as the number of students using these resources increase. Since the costs associated with the development of instructional resources are fixed, the incremental cost of delivery to an increasing number of students can be relatively small.

Many distance teaching institutions service relatively small numbers of students in each course and operate with limited budgets. To enhance course delivery, the acquisition of teaching resources produced elsewhere at less cost than original production must be an attractive proposition. Similarly, institutions with major investments in specialized development and production infrastructures (e.g. instructional design, audiovisual media, computer-based instruction) could also benefit from the sale of teaching resources to other institutions, benefiting through the amortization of development costs.

Despite the logical appeal of sharing distance teaching resources, the ACDP, in its original proposal for funding, acknowledged that such inter-institutional cooperation was the exception rather than the rule in Australian higher education. Faced with numerous perceived constraints, institutions and organizations have primarily followed the path of local development of teaching resources. The ACDP therefore based its submission to CTEC on the apparent need to develop a model aimed at facilitating active collaboration in the cooperative development and use of teaching resources. The model was to be concerned with issues such as identification of common curriculum elements and contextual factors, strategies for achieving agreement among colleges on acceptance of the use of common resource materials and educational courseware and procedures for the development of common materials. As a result of such considerations the following operational plan for the project was devised in March 1986.

OPERATIONAL PLAN

Overview

The project will entail four major phases.

The first phase will be aimed at establishing the extent to which colleges will participate in the project and will also gather data on basic course structure of UG1 Business Studies courses.

On receipt of the appropriate course structure documentation, the second phase will entail a content analysis at various levels of specificity which will enable the setting up of a database aimed at illustrating various degrees of overlap between courses at the subject/unit and topic levels.

The third phase of the project will be dependent on colleges making available various teaching resources that they use to support the various topics/units in teaching of the UG1 Business Studies course. Teaching resources supplied will then be coded and added to the existing database. Such resources will be disseminated with a view to assessing their potential utility in a variety of institutional contexts.

The fourth and final phase of the project will endeavour to gain commitment to use teaching resources across a number of colleges or to develop/redevelop materials which have been identified as lacking or inadequate.

Phase 1: Establish participation/gather data on course structure

1.1 To initiate project, send letters from Director (DDIAE) to Directors of all ACDP colleges offering UG1 Business Studies. This letter will endeavour to establish their commitment to the project and, at the same time, to gather course accreditation or appropriate course structure documentation.

Phase 2: Conduct content analysis/establish database

2.1 On receipt of appropriate documentation, content analysis will be conducted at two levels:

(i) Course/Discipline level
(ii) Subject/Unit level

2.2 Databases will be created for each of the two levels of content analysis.

2.3 Appropriate documentation delineating the resultant content structures will be forwarded to all colleges for feedback and agreement.

Phase 3: Gather/Disseminate/Document teaching resources

3.1 On receipt of comments on the aforementioned content structures, colleges will then be approached to provide teaching resources (print, text, videotape, audiotape, CML, etc) that are available to support the teaching of the various units to both on and off campus students.

3.2 Permission will be sought from the owner institution to disseminate materials among other institutions, with a view to establishing their utility in a variety of specific instructional contexts.

3.3 On receipt of information on the expressed desire to use such materials, data regarding production cost/delivery infrastructure, etc, will then be sought from the owner institution. Such information will be added to the aforementioned database.

Phase 4: Generate Outcomes

4.1 Gain commitment from a number of colleges to use existing teaching resources within an agreed financial structure.

4.2 Gain commitment from a number of colleges to redevelop teaching resources identified as inadequate. This would lead to the generation of a number of courseware development teams to work on specific topics.

4.3 Gain commitment from a number of colleges to develop new materials in areas identified as lacking sufficient teaching resources. Again the generation of a number of courseware development teams will be necessary at this stage.

PROCEDURES AND ASSOCIATED OUTCOMES

In the first phase of the project, a letter was forwarded to all institutions in the advanced education sector that offered a degree in Business Studies at the UG1 level. The response to the initial letter inviting participation in the project was very positive with all 26 institutions (Table 1) approached agreeing to become involved. Information on course structure was made freely available by participants usually in the form of submissions to relevant accrediting bodies such as the Board of Advanced Education (Queensland). This made the proposed content analysis and establishment of a database feasible.

TABLE 1: PARTICIPATING INSTITUTIONS

FULL NAME	ABBREVIATION
Avondale College	AVOND
Bendigo College of Advanced Education	BENDI
Brisbane College of Advanced Education	BCAE
Capricornia Institute of Advanced Education	CIAE
Chisholm Institute of Technology	CHISH
Darling Downs Institute of Advanced Education	DDIAE
Darwin Institute of Technology	DARWI
Footscray Institute of Technology	FOOTS
Gippsland Institute of Advanced Education	GIPPS
Kuring-gai College of Advanced Education	KURIN
Macarthur Institute of Higher Education	MACAR
Mitchell College of Advanced Education	MITCH
Nepean College of Advanced Education	NEPEA
New South Wales Institute of Technology	NSWIT
Northern Rivers College of Advanced Education	NRCAE
Queensland Institute of Technology	QIT
Riverina-Murray Institute of Higher Education	RIVER
Royal Melbouurne Institute of Technology	RMIT
South Australian College of Advanced Education	SACAE
South Australian Institute of Technology	SAIT
Swinburne Institute of Technology	SWINB
Tasmanian State Institute of Technology	TSIT
Victoria College	VICTO
Warrnambool Institute of Advanced Education	WARRN
Western Australian College of Advanced Education	WACAE
Western Australian Institute of Technology	WAIT

It became evident from the most general analysis of the content that there appeared to be a reasonable degree of overlap in subject areas such as accounting, computing, law, statistics, and economics. The apparent compatibility of certain units of study classified by subject area across institutions is evident in Table 2, which was constructed from unit descriptions included in the course accreditation documentation supplied by participating colleges.

TABLE 2: APPARENT COMPATIBILITY OF FIRST LEVEL/FOUNDATION UNITS OF STUDY ACROSS INSTITUTIONS

Computing	Accounting	Intro. to Business	Law	Statistics	Economics	Communications
	AVOND		AVOND	AVOND	AVOND	
BENDI	BENDI		BENDI	BENDI	BENDI	
BCAE	BCAE		BCAE	BCAE		BCAE
			CHISH	CHISH	CHISH	
DDIAE	DDIAE	DDIAE	DDIAE	DDIAE	DDIAE	DDIAE
	DARWI		DARWI	DARWI		
FOOTS	FOOTS		FOOTS	FOOTS		
	KURIN		KURIN			
MACAR	MACAR	MACAR	MACAR	MACAR	MACAR	MACAR
MITCH			MITCH	MITCH	MITCH	MITCH
NEPEA	NEPEA		NEPEA	NEPEA	NEPEA	
NRCAE	NRCAE			NRCAE		NRCAE
QIT	QIT			QIT	QIT	
	RMIT				RMIT	
			RIVER			
	SACAE					
SWINB	SWINB	SWINB	SWINB	SWINB	SWINB	
TSIT	TSIT		TSIT	TSIT		
WACAE			WACAE	WACAE		
WAIT	WAIT				WAIT	

An attempt was subsequently made to validate the apparent compatibility of selected foundation level units in the subject areas of computing, accounting, economics, communication, law and statistics. For the sake of convenience, DDIAE foundation units, which cover a range of subject areas, were used as a benchmark. Documentation was circulated with major topics juxtaposed against apparently equivalent major topics from each of the other 25 institutions for the following seven DDIAE units of study.

51001: Business Computer Systems
51002: Introduction to Accounting
51004: Introduction to Business
51005: Introduction to Law
51007: Business Statistics
51008: Business Economics
51009: People, Communication and Organisations

Subsequent analysis of the replies received tended to confirm the apparent compatibility between units, though, as expected the degree of overlap was by no means absolute. Respondents indicated various degrees of compatibility ranging from 30% to 80%. Further, several comments indicated that some topics were covered in units other than those nominated. It was therefore decided to extend the depth of the analysis to the topic level. Data was therefore sought on the degree to which equivalent topics existed across institutions.

To this end a copy of the DDIAE core teaching materials in the form of printed study guides for the following DDIAE foundation units were supplied to participating institutions:

51001: Business Computer Systems
51002: Introduction to Accounting
51005: Introduction to Law
51007: Business Statistics

At the previous level of analysis, these units had apparently a high degree of compatibillity across institutions. The availability of detailed study guides enabled specialist staff at other institutions to undertake a relatively fine grained analysis of the extent to which equivalent topics existed. In order to produce an indication of the relative weighting attached to each topic, participants were asked to nominate the number of hours of student effort allocated to each topic. As a guideline, the number of hours allocated at DDIAE was marked on the form. In accompanying documentation, it was explained that DDIAE students are expected to spend approximately ten hours per week across a fourteen week semester on each single credit point unit. Further, it was pointed out that the allocation of such time included all study and assessment activities associated with the unit.

This exercise proved to be a fruitful source of data as can be seen from Tables, 3, 4, 5 and 6, which focus respectively on equivalent topics in foundation level units of study in computing, accounting, law and business statistics.

TABLE 3: HOURS/TOPIC ACROSS INSTITUTIONS - COMPUTING (51001)

TOPIC	Avon	Bond	BCAE	CIAE	CHIB	DDIA	Darw	Fest	GIAE	Kuri	Macs	MITC	Nepe	NSWI	NRCA	QIT	Rive	RMIT	Beca	BAIT	Swin	TSIT	Vict	WARR	WACA	WAIT
1.1 Information Processing	3	3	3			3		2	3				5		20		6	3	7	3		5		5	5	2
1.2 Data Representation	3	3	10			3		2	1				1		30		4	3		3		10		5	3	1
1.3 Social Effects of Computing	5	4	3			4		2	2				2.5		20		4	3	8					10	3	1
2.1 Software	8	6	85			10		10	5				7.5		# #		4	3	45	10		15		10	5	15
2.2 Wordprocessing		10				10		20	10				2.5				12	6	19			20			10	12
2.3 Spreadsheets	12	15				10		28	10				2.5		30		36	6	40			30			15	14
2.4 Graphic Packages		5				10							2.5				36	1				10				1
3.1 CPU	10	4	10			10		8	5				5		25		10	6	3	5		5		10	5	1
3.2 Storage	12	6	10			10		6	5				5		25		10	3	19	10		5		10	5	1
3.3 Input & Output	6	4	20			5		4	5				5		25		10	3	3	5		5		10	5	1
4.1 Systems Analysis	4	6	55			5		12	10				2		160		6	3	4	70*		10		20*	3	2
4.2 Systems Design	5	12	70			5			10				1		160		40	3	2	*		30		*	3	2
4.3 Systems Implementation	5	6	70			5			5				1		160		60	3	6	*		10		*		1
5.1 Data Communication	3	4	60			5			5				5		160		36	3	3	3		10		10	3	2
5.2 Data Base Conc.	3	4	105			5		8	5				2.5		80		30	6	3	5		5		10	3	5
5.3 Data Base Man.	20	15	80			20		24	10						80		12	6	28	4		20		20	15	15
5.4 Info Systems		6	5			10		16	10				5		60		10	6		6		10			3	2
OPEN ACCESS		10				10			40									12		80						
TOTAL	99	125	586			140		142	141				55		1035		326	79	190	204		200		120	86	78

TABLE 4: HOURS/TOPIC ACROSS INSTITUTIONS - ACCOUNTING (51002)

TOPIC	Avon	Bend	BCAE	CIAE	CHIS	DDIA	Darw	Foot	GIAE	Kurr	Mora	MITC	Nepe	NSWI	NRCA	QIT	Rive	RMIT	Bace	BAIT	Swin	TSIT	Vict	WARR	WACA	WAIT
1. Basic Accounting Principles	10	10	10		8	10		8	10		5	12	6		15		12	10	15	8		10			10	
2. Recording Changes in Financial Condition	10	10	10		16	10		12	10		14	10	6		20		12	10	15	6		10			5	
3. Measurement & Reporting of Business Profit	10	14	10		16	10		6	10		12	12	6		25		12	15	15	6		10			10	
4. End-of-Period Adjustments & Review	10	8	10		8	10		8	5		12	10	6		10		24	10	15	6		10			10	
5. Accounting Procedures in a Merchandising Business	10	6	40 *			10			5		12	12	6		10		12	10	30	6		10			10	
6. Measurement & Control	10	6	*		2	20		8	10		12	10	6		10		12	10				10			10	
7. Control Procedures	20	8	*		8	20		4	10		12	10	6		20		24	15		6		10			30	
8. Accounting for Fixed Assets	20	10	10		6	20		8	10		14	20	6		10		12	5	15	8		10			10	
9. Control of Debtors	10	8	10		4	10		4	10		6	8	6		10		12	5	15	6		5			10	
10. Financial Statements	10	10	10		12	20		8	20		20	20			20		24	20	20	12		10			30	
TOTAL	120	90	110		80	140		66	100		119	124	54		150		156	140	110	64		95			135	156

* Total hours for 5/6/7

TABLE 5: HOURS/TOPIC ACROSS INSTITUTIONS - LAW (51005)

TOPIC	Avon	Bond	BCAE	CIAE	CHIS	DDIA	Darw	Foot	GIAE	Kurn	Macq	MITC	Nepe	NSWI	NRCA	QIT	Rive	RMIT	Baca	BAIT	Swin	TSIT	Vict	WARR	WACA	WAIT
1 Nature & Sources of Law	12.5	8	20		2	10		8	10		8	10	8		30		10	12	15	8		30		10	3	10
2 Australian Legal System	20	4	30		2	10		6	30		12	10	40		40		20		20	8		10		10	3	10
3 Judicial Process	20	6	50			10		12	80		12	10	64		30		30		20	8		20		10	3	10
4 Impact of Law on Business			15		4	10			70		10	30			20		20			72					9	30
5 Contract	35 *	36 *	55		14	30		40	30		9 *	25	24		40		20	30	60 *	16		50 *			6	30
6 Contract	*	*	15		8	30		30	40		*	30	32		40		20	30	*	24		*			4.5	30
7 Contract	*	*	25		20	30		30	30		*	20	8		40		20	30	*	32		*		15	7.5	30
8. Judicial Process		4	10			10		6			4	5	8		30			10		8					3	10
TOTAL	87.5	58	220		50	140		132	290		55	140	184		270		140	112	115	176		110		150	39	160

* Total number of hours for Topics 5/6/7

TABLE 6: HOURS/TOPIC ACROSS INSTITUTIONS - STATISTICS (51007)

TOPIC	Avon	Bend	BCAE	CIAE	CHIS	DDIA	Darw	Foot	GIAE	Kurn	Mace	MITC	Nape	NSWI	NRCA	QIT	Rive	RMIT	Baca	BAIT	Swin	TSIT	Vict	WARR	WACA	WAIT
1. State Investigation			5		6	10		6	5		6		10		1					5		6		5	3	20
2. Data			40		12	20			10		15		20				35 •		30	10		24		10	4	30
3. Data Reduction	15	30	20		12	20		12	20		15	40	20		11		•	10	30	15		20		10		20
4. Probability	45	40	40			50		18	30		55	60	50		24		48		40	30		50		4	40	40
5. Sampling & Statistical Inference	60	50	55			40		32	60		50	50	40		16		50	30	40	40		40		60	70	50
TOTAL	120	120	160		30	140		68	125			150	140		52		133	40	140	100		140				160

• Total hours for Topics 2 & 3

00: 20

While it is obvious that some institutions have nominated time allocations that exceed the requirements of single units of study, it is clear that a significant degree of overlap across institutions exists at the topic level within the four subject areas investigated. There appears to be no major reason why a similar pattern of equivalence would not emerge from the collection of relevant data in other subject areas including economics, marketing and so on.

The information collected on equivalent topics alone appears to provide adequate justification for the project. That such information could be made accessible by means of the design and development of an appropriate database (the Teaching Resources Database) highlights the potential practical utility of the exercise. The structure of the database that emerged from various design considerations reflected the aforementioned classification of courseware into subject areas and specific topics. Additionally, it was designed to encompass the level of the course offered (introductory, intermediate, advanced), different types of specific courseware components (e.g. printed study guides, audiotapes, videotapes, etc) as well as the cost of such components and their institutional source. Such a structure is designed to enable users to have the database provide information relevant to such queries as:

> "What courseware is available on the software package Open Access?"
>
> "What videotapes are available on introductory level accounting courses?"
>
> "Is there any computer-based courseware available on data reduction?"

Interrogation of the database would automatically provide associated information on costs and institutional sources. The structure of the database is not fixed, but could, of course, be modified to meet emerging needs.

Overall, the objectives of the second phase of the project concerned with conducting various levels of content analysis and establishing an appropriate database were clearly achieved. The degree of detail in content analysis could, of course be refined as could the structure of the database, but the generation of a mechanism for comparing the content of various course offerings across a range of subject areas and the construction of an associated courseware resources database seems to have been demonstrated to be both theoretically and practically viable.

The response to the third phase of the project, concerned with gathering existing teaching resources from participating institutions, was disappointing. Only three institutions (Bendigo CAE, Gippsland IAE and Warrnambool IAE) forwarded instructional materials to the Darling Downs IAE. All other institutions did not respond positively to the request to supply instructional materials for documentation on the database and possible dissemination at a later date. In any case, the dissemination of instructional materials was not terribly practical because of the relatively large number of participating institutions. It was therefore determined that it would probably be more effective to concentrate on providing institutions

with information on available instructional materials via the Teaching Resources Database, so that individual institutions could then respond to specific bilateral requests for materials as a result of having access to the database facility. Indeed, requests from seven institutions indicated an interest in using at least one component of the DDIAE materials that were distributed as part of the content analysis phase.

In an effort to engender more active support for this critical aspect of the project, it was decided to convene a meeting of the Deans/Heads of Business Studies of participating institutions. Such a meeting, organized under the auspices of the ACDP Working Party on External Studies, attracted representatives from twelve participating institutions. The meeting was held at the Melbourne Airport Travelodge on 28 August 1987. During the meeting, a videotape depicting a marketing case study was used to illustrate the potential value of sharing teaching resources across institutions. Further, the Teaching Resources Database was demonstrated using a microcomputer and associated projection device. The demonstration included examples of various patterns of interrogation of the database including a review of: institutions participating, institution by major, and institution by specific topic. Examples of database records for a variety of media including study books, computer managed learning packages, audiotapes and videotapes were also shown. While the value of such a facility was generally acknowledged, several issues were raised for consideration by the project team, including the need to:

- create a Colleges Database to complement the Teaching Resources Database in order to provide more details of course structures including prerequisites, unit specifications, objectives, textbooks, etc;
- identify staff members associated with the development of the teaching resources, with the database then being able to systematically identify staff members associated with teaching specific topics/subjects;
- clarify the relationship between the current project and the likely subsequent activities of the external studies consortium;
- identify topics at introductory, intermediate or advanced levels which are in need of development of teaching resources;
- include other fields of study such as arts, engineering, applied science, etc, in the database.

During the course of the meeting, it was agreed that the Teaching Resources Database was both desirable and viable. It was suggested that more information on course structures, prerequisites, etc, should be available to complement the information on actual teaching resources. Further, it was agreed that data collection would best be served by the design and distribution of a series of database record formats/questionnaires rather than by the collection of actual teaching resources as proposed in the original operational plan. A data collection form was subsequently designed and distributed to participating institutions. To date, seven institutions have provided comprehensive information on available teaching resources. Such information is currently (April 1988) being entered into the Teaching Resources Database.

DISCUSSION

During the course of the project, a number of constraints to co-operation in the development and use of instructional materials became evident. Barriers to genuine collaboration in the development and use of distance teaching resources emanate primarily from the strongly entrenched tradition of academic freedom. The traditional autonomy of the individual teacher, particularly in tertiary education, has promoted somewhat personalized approaches to curriculum design and instructional design. This freedom to give a personal slant to teaching is jealously guarded by many academics. Such autonomy is a major constraint to cooperation, since it is manifested, for example, in the selection of prescribed textbooks for units of study. For example, 24 different textbooks were used in one of the foundation units surveyed.

The picture is even more complicated in distance education. Since a permanent record of the instructional process is encapsulated in print or some form of electronic media, it is not unusual for instruction to incorporate references to specific system characteristics which may be peculiar to a particular institution. For example, some institutions make extensive use of telephone tutorials, reference to which is embedded in the instructional materials. This problem of the 'institutionalization' of instructional materials is further reflected in the extent to which specific institutions make various degrees of use of a whole range of distance education methodologies including residential schools, computer-managed learning, local tutors and so on. This tendency towards institutional insularity further particularizes distance education materials. Obviously, materials designed for cooperative use need to: address a wider target audience, illustrate points with a wide range of examples and minimize institution-specific administrative jargon referring to particular system capabilities. In effect, instructional materials designed to be used in a wide range of contexts would need to concentrate on substantive subject matter and be essentially system free or 'de-institutionalized'.

This line of argument does not deny that genuine differences in curricular requirements are likely to exist between institutions. The particular emphasis given to topics within a unit of study is bound to vary from institution to institution, and is likely to be further complicated by different course structures. Nevertheless, it seems reasonable to argue that the essential core of many subject matter areas will likely consist of similar topics treating the key concepts of a discipline, especially at the foundation level. Recent developments in concept mapping and related techniques suggest that the benefits associated with the careful analysis of the structure of subject matter (demanded by detailed comparisons of curricula) can, with related instructional design techniques, enhance the efficacy of student learning. In short, if approached at the topic level, detailed analysis of different curriculum requirements is likely to demonstrate that such differences do not constitute a major obstacle to collaboration in the cooperative development and use of distance teaching resources in many instances.

Strategies for overcoming constraints to the cooperative development and use of distance teaching resources can be seen to be dependent on various levels of cooperation. Such cooperation could entail:

(i) sharing existing teaching resources;

(ii) adapting existing teaching resources;

(iii) sharing expertise in the design phase of instructional materials production; and

(iv) sharing expertise and facilities in all phases of instructional materials production.

The first two levels of cooperation incur curricular considerations, since there must exist a sufficient degree of overlap between course offerings for such cooperation to be viable. The latter two levels of cooperation, however, do not invoke issues of curriculum design and should therefore be easier to engender. These latter two levels of cooperation are already in operation in Australia. For instance, within the same state, two colleges of advanced education (Darling Downs IAE and Brisbane CAE) have signed a contractual agreement whereby the instructional design specialists of one college provide advice to subject matter experts of the other college on the design of instructional materials. This model has also been used in cooperative arrangements between the Darling Downs IAE and a number of major industrial organizations.

In a more extensive collaborative effort, the Darling Downs IAE signed a contractual agreement with the Hawkesbury Agricultural College which was embarking on a distance education initiative for the first time. The contract entailed payment for the design, development and instructional materials production of two undergraduate courses: Bachelor of Applied Science (Environmental Health) and Bachelor of Applied Science (Land Economy). This latter arrangement which, in effect, makes use of an existing distance education infrastructure, makes a great deal of economic sense, since the recipient college avoided the major capital investments required to establish the necessary infrastructure. This arrangement is now in its third year of operation and evaluation of the project is encouraging. A similar contractual agreement has been signed between the Darling Downs IAE and the Queensland Agricultural College for the delivery of the latter's Associate Diploma (Farm Management) via the distance education mode.

Both the aforementioned infrastructure sharing models of cooperation have certain advantages as they effectively avoid questions of curricular compatibility and issues emanating from academic freedom and institutional insularity, since the materials were designed from scratch for a specific target audience in a particular instructional context. Further, pragmatic issues concerned with ownership were determined prior to the contracts being signed, while such issues as copyright were taken into account during the design and development phase of the courseware production. The cooperative use of a well-established infrastructure of instructional designers, editors, graphic artists, audiovisual facilities, printing and mailing facilities, appears to offer one viable strategy for active collaboration in instructional materials production for distance education.

Such a strategy has certain limitations, however, since it does not tap the potential for increased cost-effectiveness that can be achieved through eliminating unnecessary overlap in the production of courses and thereby increasing the number of students enrolled in any given course. Such initiatives demand collaboration at the curriculum level, which inevitably raises issues associated with academic freedom and institutional insularity, and thereby becomes a much tougher proposition. Let it be emphasized, however, that such collaboration is not insurmountable, it is largely a matter of attitude and policy, unlike collaboration based on infrastructure sharing, which amounts largely to a matter of economic common sense. A more comprehensive attitude change strategy is required for collaboration demanding curricular compatibility.

Attitudes are notoriously difficult to change. It therefore seems likely that, unless government funding sanctions are imposed, collaboration entailing curricular compatibility is likely to be resisted. Even then, without willing parties, the quality of the outcomes of such 'cooperation' is likely to be somewhat suspect, and more likely, the process of achieving outcomes will be extremely attenuated and therefore less than cost-effective. A more reasonable approach would be to seek willing participants in such a cooperative enterprise through, for example, the formation of teaching resources consortia on a voluntary basis in particular discipline areas. Each participating institution/organization could contribute funds to the project. Starting with a conference focusing on curriculum design issues, working groups could be established in specialized areas to document the structure of the subject matter under the guidance of suitably experienced instructional design experts. Such a conference could initiate the design and development phases of instructional materials production that could ultimately use an existing well-established infrastructure. Such initiatives appear to demand the formation of some form of coordinating agency or consortium with sufficient human and physical resources to facilitate genuine collaboration between distance education institutions.

Given the scope for collaboration in distance education applications, such a coordinating agency could usefully become involved in a range of activities aimed at making the best use of available self-instructional resources. In the first instance, it could endeavour to establish a working group to document a database of existing distance education applications in Australia. This database should delineate not only courses, but also teaching resources such as correspondence materials, audiotapes, videotapes and so on. The agency could then establish a series of Regional or National Clearing Houses for such materials, by gathering sample materials so that an assessment of their potential use in a variety of settings could be established. This type of initiative would help prevent the 'reinvention of the wheel' and hopefully make the best use of the already extensive bank of existing instructional materials.

The proposed working groups could be composed of representatives from each of the participating institutions. Initial data collection on course offerings could take place by means of questionnaires, similar to those used in the present project. Similarly, collection of sample materials could be achieved without excessive financial commitments, though space would be required for storage and an appropriate inventory system would need to be established to support the proposed

Clearing House concept. The coordinating agency could then finance a series of workshops aimed at identifying instructional materials from the samples collected that were appropriate for use in a wider range of settings than those in which they were currently being used. The identification of the extent of required adaptations of existing materials could be addressed during such workshops.

A related series of workshops could be organized to clearly document needs for new or updated instructional materials. Again, a working group could be established to coordinate a series of meetings. The group could document the curricular and instructional materials needs in terms of particular subject matter areas and viable instructional media. The involvement of at least one experienced instructional designer would be useful to help document subject matter structures and associated instructional objectives. It would also seem appropriate to involve representatives from industry, commerce, and relevant community groups as well as representatives from the formal education sector. Obviously, not every subject matter area could be represented at such meetings but some specific areas of apparent need could be given priority.

In summary, such a coordinating agency could actively promote collaboration through such activities as:

- establishing and maintaining a distance education database, delineating course offerings and instructional materials;
- establishing a resource collection of instructional materials;
- establishing associated Regional or National Clearing House operations;
- conducting a series of national workshops to assess the potential utility of existing instructional materials in a variety of educational contexts;
- promoting the cooperative use of existing instructional materials through seminars and orientation courses; and
- facilitating the cooperative development and use of instructional materials by conducting a series of national workshops to delineate curricular and instructional needs in particular subject matter/vocational areas, such as:

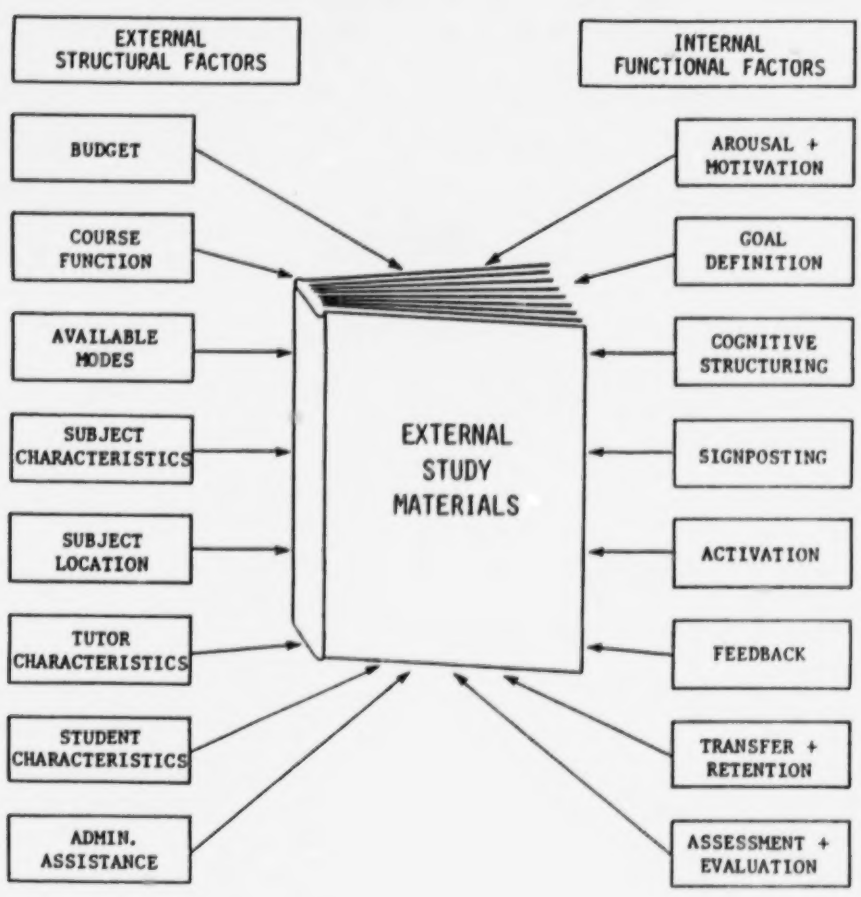
  engineering education
  teacher education
  business education
  science education
  mathematics education
  nurse education.

The advanced education sector, under the auspices of ACDP has taken steps to pursue the notion of a coordinating agency through the establishment of the Australian Distance Education Consortium (ADEC). The objectives of ADEC were delineated, as follows, at the inaugural meeting held at Victoria College, Malvern, on 30 October 1987. The Consortium has as its primary aim the provision of educational opportunities in a cost effective manner through avoidance of

The point that is being made here is that whether we are working at associate diploma, diploma, baccalaureate degree, graduate diploma or master degree, the above Gagnerian-type principles are necessary if we are to be successful educators. It matters not whether the subjects to be offered are face-to-face, correspondence tutorial or external mode since the same basic principles apply whichever the learning environment. What changes with mode of delivery is the methodology whereby educators provide the nine instructional events to their students.

Many of you will be familiar with the model developed by Meacham and Evans (1980) for the design of external study materials at RMIHE (Figure 1). In this model Gagnerian principles are clearly in evidence, particularly in the right hand column where Meacham and Evans itemise what they describe as the "internal functional factors". For example, Gagne's first principle is covered in the box "Arousal and Motivation", his second principle by the box "Goal Definition".

MODEL FOR THE DESIGN OF EXTERNAL STUDY MATERIALS AT R.M.I.H.E.



The Division of External Studies cooperates with teaching staff to ensure that the learning environment for distance education students is based upon sound educational principles. As RMIHE moves towards the provision of subjects at Master degree level it will be important that these educational principles remain in the forefront of our thinking.

unnecessary duplication and sharing of physical and human resources by member institutions. The objectives of the Consortium are:

(i) to facilitate consultation and cooperation amongst all providers of external studies;

(ii) to facilitate the exchange of teaching materials among participating institutions (procedures to support this might include course content analysis, standards development, teaching material database creation, information exchange and communications networking);

(iii) to facilitate student access to inter-institutional enrolment in individual external subjects and course units;

(iv) to engage in any other activities which would facilitate the attainment of the above objectives, which might include:

(a) facilitating the introduction and cooperative development of teaching techniques based on information processing, transmission and display technologies;

(b) exploring the possibilities for the development of shared combinations of subjects and course units;

(c) monitoring the availability of external studies programs and facilitating a timely response by institutions to the educational needs of a changing society;

(d) facilitating the development of books and other textual materials associated with teaching programs; and

(e) encouraging the development and use of shared support facilities for external studies.

At the second meeting of ADEC, held at Canberra CAE on 11 March 1988, members of the Consortium resolved that the present cooperative courseware project be invited to work under the umbrella of ADEC, with the Consortium providing support and facilitation for further activities. Thus, work on the establishment and maintenance of the Teaching Resources Database is continuing. Subsequent activities associated with the project will follow the sequence of activities for the proposed centralized coordinating agency delineated above. At this stage, however, it seems reasonable to conclude that in the advanced education sector, interest exists in the cooperative development and use of distance education materials, that the development of a Teaching Resources Database can effectively facilitate such active collaboration among institutions, and that a series of national workshops aimed at delineating curricular and instructional needs in specific discipline areas will be required to generate actual cooperative development and use of materials on a level capable of taking advantage of potential economies of scale.

USING COMPUTER BASED COMMUNICATIONS TO REDUCE THE DIFFICULTIES OF DISTANCE EDUCATION

ABSTRACT

The difficulties of distance education are many, and can be seen to be largely based on the problems associated with the traditional means of communication between students and staff - the letter and the phone call.

Both these communication methods suffer from the problem of poor time responsiveness, and contribute to the external student's often expressed sense of isolation from lecturers and fellow students.

By utilising computer based electronic communication facilities for both 'routine' communications and for assignment submission and return, a very time responsive and cost effective environment can be provided.

This paper describes the electronic communication facilities and their method of usage, as undertaken by the author and his students in a second semester 1988 subject at the Riverina-Murray Institute of Higher Education (RMIHE).

INTRODUCTION

The RMIHE offers a two year, External Post Graduate Diploma in Computer Applications consisting of two subjects each semester for four semesters. The use of electronic communications with minimal residential school attendance requirements is a fundamental basis of the course design. Students are required to attend an initial course based residential school of five days, at which they receive instruction and demonstrations on the use of electronic communications (via Telecom's AUSTPAC service, into which one of the Institute's VAX computers is connected) as well as an introduction to their first two subjects. The residential school is designed for students with NO prior computing experience although increasingly students do have some previous computer use exposure.

As well as instructional content, the residential school also gives the students the opportunity to meet staff and fellow students. This is significant for future communications, as it is often commented that having previously met your correspondent makes subsequent non face-to-face communications easier.

The format of each of the subjects in the Graduate Diploma is that of a 'traditional' printed mail package, which contains the Subject Outline (objectives, texts, references, assignments, due dates, etc), and the associated Notes and Readings.

What is different however, is that all students are REQUIRED to log on to the Institute's VAX twice a week during semester time to check for Electronic Mail messages and to send their own messages and assignments. In this way, students and staff are potentially only a matter of hours apart, depending on how frequently people log in to the central computer to check for messages.

Apart from the initial course-based residential school the only other planned meeting of the students and staff is the final residential school at the end of the fourth semester, at which the students present and defend their major project - a computerised real life application.

COMMUNICATION DIFFICULTIES

Student Difficulties

The major difficulty experienced by students in the past has been that of contacting their Lecturers. The use of letters is time consuming, with two to four days (each way) delay (including internal deliveries within the tertiary institution) being likely, and even more days for some students in areas where postal deliveries are less frequent or otherwise delayed. A typical turnaround of eight days, allowing two days for the Lecturer to be able to respond, can be expected.

This week or more delay is significant, when it is considered that a typical external teaching semester is approximately 15-16 weeks (excluding exam periods). This constitutes a delay of about 8% of teaching time - for each letter.

Thus, students often turn to the use of the telephone, which, from all accounts, is a very frustrating experience, due to the difficulty of requiring 'coincident' communication - that is, the Lecturer being available at the same time that the student is available to ring (and vice versa when attempting to return the call). Similar problems occur when the student attempts to call another student in the class.

The communication difficulties of the student can be offset to some extent by having residential schools for each subject, but this of course introduces the further difficulties of time away from work and family, and the travel and accommodation expenses that must be incurred.

Lecturer Difficulties

From the Lecturer's point of view, the communication difficulties can be equally frustrating. When the only means of providing additional feedback or of showing general support and interest in the student's progress, is to wait to put a note in with the student's next assignment or instigate a separate letter mailing, a sense of 'remoteness' can be seen to apply to academic staff also.

COMPUTER BASED SOLUTION

To overcome the difficulties of letters and phone calls, computer based electronic communication (Electronic Mail - known as Email, and electronic datafile transfers) can be used. Whilst these methods have little affect on the time needed to prepare or review the details to be communicated, they do provide rapid (seconds or minutes) transfer of the document/item from the student's location to the RMIHE computer, after which a few quick commands will send the material to the Lecturer's incoming 'computer mail bag'. The rest of this paper will discuss the facilities needed by the student (and the Institute), and how they were used in a recent subject.

STUDENT'S REQUIREMENTS

Each student in the Graduate Diploma is required to have their own, or ready access to, a microcomputer and a modem (a device to allow the microcomputer to be connected to a telephone line for data communication purposes) and the appropriate software (program) to allow that microcomputer to communicate. No prescription as to manufacturer or model is made, only that it must be able to communicate (via Telecom's AUSTPAC service, or direct STD dial) to the Institute's VAX central computer.

At the initial course based residential school some time is allocated to demonstrating suitable equipment and providing advice as to how this can be purchased. The Institute and staff do not support/ recommend any particular brand/model, but at present, the most suitable/popular seem to be IBM PCs and compatibles, Apple Macintoshes and Commodore Amigas, although many students have been successful on other equipment.

Depending on the features and sophistication of the equipment chosen by the student, a typical setup cost of $1000-2000 can be expected, but this can easily be defrayed against the cost of attending several extra residential schools for the course. An added bonus is that the student will become competent in the use of their microcomputer during the course duration, over and above the mastery of the course content.

INSTITUTE PROVISIONS

Central Facilities

To make this Email approach operative, the Institute (RMIHE) must provide all the necessary central resources for the use of the students and staff. Currently the central system is a VAX 8200, which has many local terminals for staff and internal on campus students, and a connection (at 9600 BPS) to Telecom's AUSTPAC service that can support 15 concurrent users. Additionally, there are three direct dial modems available on the VAX, enabling students to bypass AUSTPAC should our 15 users limit be fully utilised (which is rare) and for local phone area users.

Each student is allocated a unique Username on the VAX, including a certain amount (depends on subjects being studied) of disk storage space. Each username is so established that privacy is enforced, in that no other user (excepting the system manager) can access a student's files, nor can the student relax this constraint. Thus each student can confidently work independently on the central computer when necessary. The standard VAX Electronic Mail facility is used between students and lecturers, and between students.

Student Access

To simplify the student's method of access, and to remove the need to become a Telecom AUSTPAC account holder, with associated setup and maintenance charges, the Institute's VAX accepts reverse charge communications from the microcomputers of VALID students. To achieve this control, special access and accounting software has been developed, to check (for each AUSTPAC user logging in), that the user is acceptable, and that they have sufficient communications CREDIT (in minutes) available. If the user is not valid, or does not have any time credit remaining, they are suitably informed, and automatically disconnected.

As the students use the central computer via AUSTPAC, their usage is recorded and debited against the amount of communication time credit remaining. All AUSTPAC charges for all the students are billed to the Institute, which in turn recovers the cost from the users (currently at a recovery rate of $8 per hour, which compares favourably with peak time STD charges of around $25 per hour from Sydney, for example).

Student Access Subsidy

The students are provided with an amount of 'free' AUSTPAC usage time for each subject, with the amount varying between five and ten hours per subject (larger amounts are for the earlier subjects). If a student requires additional access time, they send a cheque for the appropriate amount, which is then credited to their AUSTPAC use account.

In many subjects, the students will need to use more than their 'free' allocation (the amount varying with the ability of the student and the features of their microcomputer), but again this additional cost must be weighed against the reduced need for residential schools, and the vastly improved communication responsiveness with lecturers.

THE AUSTPAC CONNECTION

To access the Institute's VAX via AUSTPAC, a relatively simple process must be undertaken by the student. Again, this is described in detail and demonstrated at the initial residential school. A simplified description would be as follows.

Once the student's microcomputer, modem and phone have been correctly connected and turned on, and the Communications program loaded into the computer (from its hard or floppy disk), a special phone number is

rung, which gains access to the nearest AUSTPAC communications computer (local call fee), which 'answers the phone'. From the keyboard of the microcomputer the student instructs the AUSTPAC computer that access to the RMIHE VAX is required via a short one line command. This connection is automatically established or an error message displayed if this is not possible. (That is, our VAX is disabled or the 15 concurrent user limit has been reached.)

Once access has been established to the Institute VAX, it responds with the normal login sequence (Username/Password etc), which includes, for AUSTPAC users, a check as to whether there is AUSTPAC communication time still in credit.

USING THE ELECTRONIC MAIL FACILITIES

Overview

For readers unfamiliar with Email systems, these systems provide the facilities to prepare and send memos between yourself (i.e. the currently logged on user), and any other user on that computer system, whether or not the intended recipient is currently logged on. The major benefits of Email thus include the fact that you can send a message even if the recipient is not available to read it at that time, and that both the sender and receiver can keep a copy of all messages if they so desire.

When a user logs on to the computer, they are automatically advised if there are new Email messages for them to review. Thus Email users can access the computer, read and respond to messages at times that are convenient to them. If people check and respond on a frequent basis (once or more daily) then very rapid exchanges can occur.

Storing/Searching Messages

Email systems, such as those on the VAX, often have additional (over READing and SENDing) facilities, for the filing/storing and searching of messages. This means that messages can be stored in 'labelled FOLDERS', which can be summarised by a folder DIRECTORY, and can be searched for any phrase or word. This can be very powerful when trying to find the message on 'aardvarks' that was sent to you recently, but you can't remember from whom, or alternatively when trying to find all the messages that were sent from username STUDENT99.

Forwarding and Broadcasting

Other Email facilities allow a user to forward a message to another user. This is useful if the sender's request/comment needs to be sent 'as is' to another user without retyping. In addition, a sender can broadcast a copy of a message (entered only once) to every user on a particular distribution list (useful for lecturers to send comments, assignment results, additional notes or explanations to all students in the class).

Typical Uses

Apart from the broadcast use described above, the most common use of Email during the teaching semester is that of Question and Answer. This operates both ways: Students can send in queries about the material that has been provided, or seek extra information. If the same question seems to be common from a number of students, the first answer(s) can be simply broadcast to all the members of the class, thus reducing Lecturer time for individual answers, and saving student time in composing questions! Conversely, the Lecturer can query students as to their progress (or overdue assignments), and seek feedback on aspects of the subject that may need review for the next presentation.

One of the interesting uses of Email that has arisen, is that of the 'electronic study group'. Although often hundreds of kilometres apart, students can keep in touch via Email and discuss aspects of the course as it progresses. This is obviously a major benefit for the students, as it helps to remove the sense of isolation from their fellows. It does however, mean that the Lecturer must be very consistent in responses and explanations, as often one student will forward your reply to another for comment or information, and the next day the Lecturer might receive a question from Student 2 starting 'In your reply last night to Student 1, you said ...'

As an indication of the scale of use of Email communications, during the example subject, the Lecturer amassed over 555 messages (total incoming and outgoing), with a class size of approximately 20. Although some of the messages were long (40-60 lines), most were relatively short (10-20 lines).

Minimising Communication Costs

Since the students are paying (after the 'free' allocation) for each hour or part thereof (pro rata) that they spend connected via AUSTPAC to the VAX, it is important that they do not spend too much time on-line (connected) preparing messages to be sent via Email, or reading those received. During the initial residential school the students are taught how to transfer files of data or text from their micro-computer to the VAX and vice versa, how to use the contents of a file as an Email message and how to extract an Email message into a file.

Thus the student's most cost-effective procedure for sending a message is to prepare it locally on the micro (not connected via AUSTPAC) using their own editor or Word Processing (WP) facilities until it is ready for sending. Then log onto the VAX and upload (send to the VAX) the prepared message (much faster transfer rate than could be typed directly). When that transfer is finished the message can be Emailed via a few short commands from the (transferred) file to the intended recipient.

Conversely, incoming (to student) Email messages can be placed into a file for downloading (to their micro from the VAX), after which the student logs off the VAX (thus ceasing to incur communication costs) and then uses their own local WP facilities to read and consider the messages, and to prepare responses if necessary, and so on. This approach can be very cost effective, as the only 'online' time necessary is the simple receiving/sending of messages, and transfer between the central computer and the student's computer (at, for example, 120 characters per second).

The facilities described above can, of course, also be used to transfer items of assessment between the student and the Lecturer, or to provide the vehicle for the student to answer an 'online' quiz of some kind. For example, a controlled interactive session of questions that the student must answer, typically with A, B, C, D or True/False alternatives.

The nature of the assessment item (assignment) has a significant affect on how the electronic communications can be used. If the assignment is a factual recall test of some kind, then the interactive quiz described above can be useful, as has often been demonstrated. Frequently however, the student cannot be adequately assessed in this manner, especially in more advanced (conceptually) subjects, where some form of essay or series of written answers is preferable. In such cases, many academics would want the marking to be done by 'a human who can impart academic judgement' on the topic(s), rather than automarking with 'canned' or predetermined answers. (The future developments in Expert Systems may well apply here however!)

Thus there is a need to gather the individual written assignments (including, perhaps, simple diagrams) from the students' diverse locations, and then to distribute these to the appropriate marker, or markers, since multiple markers are often required for subjects with a high enrolment.

Using the electronic communications facilities is an obvious way of gathering the students' assignments, and this method can also be used for assignment distribution to the marker(s).

Traditionally, the academic staff must be located physically near (in internal mail distribution terms) the centre that receives the posted written (paper) assignments. However, if the assignments have been received (and stored) electronically on a computer, the academic staff, via their microcomputers, can access and retrieve the assignments from any location which has a phone, thus allowing staff to work anywhere in the country (or world, with a little more communications cost).

For the subject that this article refers to, there were four assignments to be submitted and a final examination to be conducted under normal examination centre invigilated conditions. Two of the assignments (numbers 2 and 3) were considered major (a Database Design, and its subsequent Implementation on a computer). The other two (numbers 1 and 4) were considered of moderate size (3 to 10 page submissions) comprising written answers on Database Theory concepts, and on Database Systems Use and Control.

These last two assignments (1 and 4) were selected for trial via a totally Electronic handling method, primarily to minimise the turnaround time. The Theory assignment was needed back quickly by students to assist in the preparation of the Database Design, and the Use and Control assignment was needed quickly to provide final feedback before the end of semester examination.

THE PAPERLESS WRITTEN ASSIGNMENT

Preamble

The students were advised in the Subject Outline that the assignments were to be submitted electronically for fast turnaround. Further details early in the semester (distributed, of course, via an Email Broadcast) were sent to the students giving more details on the procedure students should follow.

The Procedure

The students prepared their submissions in the normal manner, which included entry of their answers into the WP facilities on their micros. However, instead of printing out the final copy for submission by post, the final copy was 'printed' into a (ASCII) disk file, that could be transferred electronically (uploaded) from their micro to the VAX.

Once the submission had been transferred to the VAX (only a matter of minutes, depending on the speed capability of the student's modem), it could then be easily submitted to the Lecturer via the Email facilities.

Each time an assignment was received by the Lecturer an immediate acknowledgement was sent. This involved a short stored message such as "Your assignment 1 has been received". This was sent to the student by return (REPLY) Email allowing the student to know that all was well. The assignment was extracted from the Email system and placed securely in a file in a protected (sub-) directory of the Lecturer's username. The above two actions each required one short command.

Each student's assignment was placed into a file which contained in the filename the (VAX) username of the originating student for future return purposes. Each file was then permitted (read only) to the username of the person who was to be the marker who was advised of newly arrived assignments via a brief Email message.

Periodically, the marker would sign onto the VAX (usually from home - 40 km away - as he is a part-time staff member) and simply transfer all new assignments onto the hard disk of his micro. Then using his WP facilities, he would mark each assignment.

The marking process paralleled what would happen with the traditional pen on paper process. Function keys in the WP package were set to generate symbols such as ticks, crosses and question marks, which were quickly entered, where appropriate, into the student's submission. Where necessary, comments were inserted (typed), always being prefixed by a ## (2 of #) symbol, so that these comments could easily be found by the student using the search facility of their own WP once the assignment had been returned.

The marked assignments were uploaded to the tutor's username on the VAX, and securely permitted to the lecturer, who was advised (via Email), that they were available for return to the students. The lecturer could then review the assignments and formulate overall

general comments for the class. The total mark for each student was extracted, and then sorted so as to provide each student with a clear indication of the overall result achieved by all the students. In this way students were able to compare their mark with the remainder of the cohort.

The general comments and marks distribution were sent to all students in the class via Email Broadcast after which each student was sent back (via Email again) their individual assignment, as marked.

The total turnaround time for the first assignment, from the date the assignment was due to the time it was returned by Email and thus available for retrieval by the student, was eight calendar days, but this could have been only four or five days had the tutor not been off work for three days with the 'flu! Furthermore, if the marker had been a full-time staff member, a two or three day turnaround would have been realistically achievable. As it was, the eight days still compared more than reasonably with the best to be expected by normal hard copy and postal procedures.

Advantages of the Approach

- Unless the students took a draft/final hard copy, no printing or paper consumption was necessary.

- Students were able to submit electronically right up to the due date deadline, thus allowing them several extra days to complete the assignment, since postal delay was not a concern.

- The potential inequity of different postal lead times between students in different locations was eliminated.

- Students were able to receive immediate (as at the next time they logged into the VAX) confirmation that their assignment had been received.

- An electronic copy of a student's assignment was held in their computer system, the Lecturer's VAX files, and the marker's micro and VAX files. Consequently the assignment could not be lost in transit.

- The lecturer could easily maintain records and control over the entire procedure including when assignments arrived, which assignments were 'out' being marked, which assignments were available for return, marks achieved by the students, and so on.

Disadvantages of the Approach

- The major disadvantage from a student's viewpoint, is that several thousand dollars worth of microcomputer and modem equipment is required, as is the suitable WP and communications software. In this program however, the students were already required to have such facilities, so this disadvantage did not apply.

- Since it was the first time that the Lecturer and Tutor had attempted this procedure they were a little slow in 'processing', but this will undoubtedly improve with practice.

Student Reactions

All students expressed satisfaction with the rapid turnaround of the assignments and none expressed any difficulty with the overall approach to be followed. Some expressed a desire for an increased amount of comments on their assignments, but this was due more to the restricted staff time available for the marking per se than the method of marking undertaken. Typing comments can be just as fast as writing them (and usually more legible!) although sometimes a quickly drawn (pen on paper) sketch or comment can be effective.

Marker Reactions

The tutor who marked the assignments found no difficulty in the overall procedure to be followed, and all the assignment transfer (Kermit protocol) went without a problem. He expressed the view that 'good' assignments were easy to mark in comparison to pen on paper marking. However some of the 'poorer' assignments took longer to mark, due to the need to type in detailed comments. The tutor is enthusiastic to do more marking in this manner.

The marker also suggested that comments he found he had to make frequently on student assignments could be stored in small files on the hard disk so that they could be retrieved and pasted in place where appropriate on student assignments. The idea has great merit and should make marking in future faster and more comprehensive.

Lecturer Reactions

The ease by which the assignments could be received, distributed for marking, and generally controlled, was a major plus. Even though this first test group was relatively small (20) it would appear that the approach will work with larger groups, and future uses of the 'paperless written assignment' are most definitely planned. Hopefully even better ways to streamline the process will be developed.

SUITABILITY FOR NON-COMPUTING SUBJECTS

As you can see from the above discussion, the use of computer based communications and WP marking is in no way dependent on the subject content. It would appear that this approach is suitable for assignments in subjects in other disciplines taught externally. There is however a need for a certain amount of computer usage experience on the part of academic staff before this will be successful.

It is important to emphasise that the use of Electronic Communication/WP technology in no way reduces the flexibility of the marking process and comment provision, and in fact, with experience, could even promote an increased quality of feedback possible from the same amount of staff time consumed.

The fact that the Grad. Dip. Computing students were already required to have the suitable facilities certainly allowed (in fact fostered) the establishment of this 'paperless' approach. Perhaps the time is not far away when tertiary students in Australia (undergraduate and postgraduate) will all be required to have such facilities. As the real cost of the equipment continues to fall it will not be too great a financial hardship to bear. An essential requirement that must not be omitted however, is the initial training that students should undertake to get them to a reasonable level of proficiency in the use of the Communications and Email system facilities.

CONCLUSION

As evidenced by this study, the isolation difficulties of Distance Education can indeed be significantly reduced by employing the technology available in Computer Based Communications Systems. As students become more capable in the use of such systems, and whilst the cost appears to be continually reducing in real terms, we must now stop asking the question "can we afford to educate this way?", but rather we must ask "can we justify the omission of the use of such facilities in Distance Education?".

THE INTRODUCTION OF EXTERNAL MASTER DEGREES BY COURSEWORK AT RMIHE

ABSTRACT

This paper argues that the introduction over the next two or three years of as many as fifty new subjects at Master Degree level by the distance education mode will demand innovatory approaches in design and delivery (teaching). Whereas sound principles of learning must be maintained, the objectives of Master Degree work necessitate that special attention be directed to assessment procedures, residential schools, two-way communication systems, access to library resources and instructional design. The paper cautions against the use of existing external study materials except in special circumstances.

LEARNING PRINCIPLES

If you were asked to compose a list of the factors that collectively provide an acceptable learning environment you would probably have little difficulty in doing so. Lists might vary in detail and emphasis, of course, depending upon such fundamental considerations as the nature of the subject to be taught, the characteristics of the clientele, the approach to be adopted and the overall objectives. Nevertheless, irrespective of the level at which a subject is to be taught or the mode whereby it is to be offered, certain basic learning principles would, hopefully, be apparent.

It is not the purpose of this paper to discuss at length precisely what these educational principles should be. However, most educators would agree that the nine instructional events required to support the internal mechanism of learning espoused by Gagne and Briggs provide an excellent starting point. These are:

1. gain attention by directing students to the topic at hand;
2. inform learners of the objective by making them aware of the instructional goals so that students may acquire the necessary 'mind set';
3. stimulate recall of prior learning;
4. present stimuli with distinctive features that are inherent to the learning task;
5. guide learning in order to reduce the occurrence of irrelevant 'hypotheses' and thereby increase the efficiency of learning;
6. elicit performance by directing students to perform activities that give them an opportunity to practise and apply newly acquired skills;
7. provide formative feedback that reassures the students, suggest remedial action to improve their weaknesses, and give them an opportunity to go beyond the immediate situation;
8. enhance retention and learning transfer to new situations;
9. assess performance or provide a summative evaluation of the students' progress.

(Gagne and Briggs, 1979)

PROPOSALS FOR MASTER DEGREES BY COURSEWORK

A significant new development is now occurring in relation to the level of courses soon to be offered externally at RMIHE. During 1989 and into the early 1990s the Institute plans to provide up to 50 new subjects at the Master degree level. The following Master Degrees with coursework components are at various stages of planning. (Table 1)

TABLE 1

MASTER DEGREE PROGRAMMES PLANNED FOR OFFERING BY THE EXTERNAL MODE
(Totally or partly by Coursework)

Programme and School	Expected number of subjects on offer	Year of Introduction by the external mode
MAppSc (Agriculture) School of Agriculture	8?	1989 (Spring)
MAppSc (Computing) School of Information Studies	?	1990
MBus (Accountancy) School of Commerce	?	1990
MBus (International Business) School of Commerce	6	1989 (Spring)
MEd (Education) School of Education	16?	1989 (Spring)
MHlthSc (Nursing) School of Education	?	1991
MSocSc (Social Science) School of Humanities and Social Sciences	?	1990

A number of other initiatives at the Master degree level are currently being considered by Schools but have not yet been submitted to the Principal's Planning Committee. Until such time as these have been officially presented and approved by the Principal's Planning Committee such degrees have no official "status" and will not appear on the Institute's profile.

For a few years now, a Master degree by thesis has also been available at RMIHE in Education (MEd) and Medical Laboratory Science (MAppSc). This paper, however, is solely concerned with Master Programmes by course-work so no further reference will be made to these two degrees.

INSTRUCTIONAL DESIGN PROBLEMS

The burgeoning of subjects to be offered externally at Master degree level adds a new dimension to our teaching by the external mode. RMIHE will very shortly be offering external subjects from associate diploma through diploma, baccalaureate, graduate diploma to masters level. It is perhaps timely to consider the implications for the instructional design of external study materials offered at so many levels and particularly at the Master degree level. We should focus on three pertinent questions:

1. What are the special requirements of study at the Master degree level? (i.e. coursework)

2. How do we most effectively provide for any special requirements in the design and delivery (teaching) of subjects at Master degree level? and

3. Given the limited resources available, how acceptable is it to use existing graduate diploma or baccalaureate subjects as part of a Master degree?

The Australian Council on Tertiary Awards (1988) has this to say about Master degrees by coursework:

> "Master degree courses are intended to provide for intensive study in a particular field, usually focusing on professional development. They differ from other graduate courses in both length and objectives.
>
> Candidates will have shown above average performance in studies for a bachelor degree, or have demonstrated in their professional activity potential to undertake master degree studies. Candidates who have performed at a high level in graduate studies which take to greater depth the field of previous undergraduate study may be considered to have completed part of the requirement for a master degree. They will pursue their subject area at a significantly higher level than that expected in a bachelor degree.
>
> For candidates with a pass degree, the duration of study will normally be two years of full-time study or the part-time equivalent. In the case of candidates with an honours degree or where exceptional circumstances exist relating to previous study, the minimum time would be one calendar year of full-time study.
>
> Master degrees may be awarded either for fully research-based activity or for courses of study combining research, project and coursework in varying proportions, with the research or project work determined on an individual basis."

Particular note should be taken of three points made by the Australian Council on Tertiary Awards (ACTA). First, the expectation that a Master degree will normally take two years of full-time tertiary study or its equivalent. For an external student this usually means a minimum of four years. A full-time workload at RMIHE is normally 16 units per semester which is 64 units over two years. External students would

usually attempt eight units per semester for eight semesters to attain the required 64 units over four years. This is a long time. Serious consideration should be given therefore to the introduction of Summer Schools for Master degree students to enable them to complete in shorter time.

The second important point made by ACTA is that not only are Master degrees to be different to other graduate courses in length but also in their objectives. To better understand this differentiation of objectives it is necessary to go back to the 1986 statements of the Australian Council on Awards in Advanced Education. Paragraph 22 states:

> "Master degree courses will be expected to be postgraduate in time and substantially postgraduate in standard. Master degrees are seen to differ from graduate diplomas not only in their length, but also in their objectives. A master degree course aims to provide studies in depth in a significant part of a discipline at a high level, whereas the graduate diploma course is designed to provide a study in depth of one aspect of a discipline. Master degree students would therefore be expected to attain a conceptual understanding of their discipline which is significantly higher than that expected within a bachelor's degree, and broader than that of the graduate diploma."

In differentiating between Master degrees and graduate diplomas the Australian Council is quite clear. "A Master degree course aims to provide studies in depth in a significant part of a discipline at a high level, whereas the graduate diploma course is designed to provide a study in depth of one aspect of a discipline." The coursework content of a Master degree must involve significant depth and breadth across the particular discipline. It is most unlikely sufficient depth and breadth required for a Master degree subject can be attained with the standard four unit subject offered at baccalaureate or graduate diploma level. Arguably to achieve the required depth and breadth, all subjects at Master degree level should be designated as eight unit subjects thereby providing the rigour that such a high loading demands. This is under debate at Higher Degree committee now.

Third, the Australian Council on Tertiary Awards stipulates that "... Master degrees may be awarded either for fully research-based activity or for courses of study combining research, project and coursework in varying proportions, with the research or project work determined on an individual basis." If we accept the argument that the RMIHE Master degree subjects should be designated a unit value of eight, it follows that the number of subjects a student should attempt is eight (8 x 8 = 64 units) at least one of which, should be project work. Flexibility can be maintained within such a model with respect to the emphasis given to the project work. One student may, for example, elect to complete four subjects (4 x 8 units) and attempt a 32 unit project; another may prefer six subjects (6 x 8 units) and a 16 unit project. In advising students what weighting of subjects/project they should complete it is essential to keep in mind the need for both depth and breadth, otherwise there is a very real danger that students may achieve depth at the expense of breadth if they concentrate on too narrow a field. Alternatively, a student who studies eight units (only one of which is a project) may attain overall breadth but insufficient depth. To prevent this situation occurring it is important to ensure that the project explores at greater depth issues covered in the subject work. Some academics may have reservations whether an eight unit project can provide such depth and might argue that at least 16 units is the minimum necessary.

With the anticipated proliferation of at least seven Master degrees at RMIHE over the next two or three years it would be adviseable to instigate an overall policy on the matters already raised in this paper. Such a policy could provide a model for new Master degrees. The remainder of this paper examines the implications of what has so far been argued with regard to the design and delivery of Master degree subjects by the external mode.

The offering of Master degrees by distance education is still considered questionable by some universities and colleges. Critics question the ability of external providers to supervise advanced project work, to provide adequate opportunity for the presentation of advanced papers in seminars and point to the difficulties students have in obtaining sufficient access to postgraduate library resources. (White 1980, Bynner 1986). Such concern about the effectiveness of teaching Master degrees externally can only be dispelled by the quality of the students who graduate. Thus it will be several years before any lingering doubts about RMIHE's external Master programmes will disappear.

The taught Master degree (by coursework) falls between the didactic approach of undergraduate work and the independence of the research based higher degree. Students entering our external coursework Master programmes must be provided, therefore, with learning experiences which will enable them to work semi-independently. As far as the design of the distance education materials is concerned this would require the removal of techniques frequently adopted for less independent undergraduate learners such as self-assessment questions, revision exercises and the use of numerous examples to reinforce learning.

The nature of study at Master degree level demands extensive reading and steps should be taken to allow students additional borrowing privileges from the library. It is unlikely that only prescribed textbooks will be used at Master degree level. Instead study materials should include comprehensive lists of further recommended reading. Because it is imperative to keep abreast of new developments in the discipline, consideration should also be given to the introduction of loose leaf binders. This enables the easy removal and addition of material each year as required.

TELECONFERENCING

Enrolments in external Master degree subjects are likely to remain small and this in itself will influence the teaching methodology. Small enrolments will enable teleconferencing, for example, to become a major teaching strategy. (Up to nine stations and a lecturer can participate at any one time.) Teleconferencing sessions will need to be properly planned and integrated into the semester's work so that all participants are fully aware well beforehand of the issues to be discussed and their own responsibilities. To an extent, skilfully chaired teleconferences can replicate seminar sessions. (Roberts, 1985)

The nature and purpose of assignments and assessment procedures at Master degree level will also need careful consideration. As always, assessment should be designed to indicate the extent to which students have mastered the objectives and this is sometimes more difficult to do when students are studying at a distance. The type of objectives that Master degree students are expected to achieve are very different to those expected of an undergraduate. For example, overall objectives for the Master of Education and the Master of Business (International Business) are as follows:

Master of Education by Coursework Overall Objectives

First, it is believed that students should be introduced to the nature of educational enquiry. Educational questions/issues need to be considered critically and within particular social contexts. Educational problems arise from an interplay of cultural, social, individual and institutional factors, and it is important for students to develop the capacity to view educational issues within these wider parameters.

Second, students should be introduced to the various methods employed in education enquiry: how researchers collect data, overview these data, analyse them, and present them.

Third, they should be introduced to the importance of research and the integral part it should play in educational thinking. Research and research findings will underpin not only the thesis component of the course but also the coursework subjects.

Fourth, students should have the chance to engage in an independent study (their own educational enquiry) in which they can demonstrate their ability to explore some educational issue, refer to and critically explore the research evidence, and present their findings in a professional fashion.

Fifth, students should be able to explore in some depth a segment of Education in a systematic and rigorous manner.

Master of Business (International Business) Overall Objectives:

Depending upon their selection of optional subjects, graduates should, at the completion of the course, be able to:

(i) adapt business practices to environmental factors, i.e. recognise business attitudes within different cultures, comply with business and social protocols of host countries and so build trust and rapport in cross cultural business relationships;

(ii) interpret and respond to different cultural styles of personal communication;

(iii) recognise the effects of historical and geographical factors and religious practice on the culture and the business practices of trading partners and host countries;

(iv) interpret the formal and informal political and economic systems practised in the host country, evaluate domestic economic conditions and technological infrastructure, etc.;

(v) identify the legal and judicial systems of host countries and trading partners and particularly the laws which affect international exchange;

(vi) understand diverse employer - employee relationships and variations in industrial relations policy and practice in host countries and trading partners;

(vii) describe key factors influencing the international economy and to analyse within a sound theoretical framework factors (and institutions) which facilitate or inhibit the flow of economic goods and resources between nations;

(viii) conduct marketing analysis (including product analysis, distribution analysis, risk analysis, price research, etc.);

(ix) implement marketing strategies - marketing plans, promotional products, promotional techniques, pricing strategies, etc.;

(x) manage financial resources under conditions of risk and uncertainty - assess financial strategies, funding sources and identify financial regulations of the host country; and

(xi) understand international currency movements, the determination of monetary exchange rates and assess the impact of currency control.

The above examples of Master degree objectives demand an overall depth and breadth of knowledge, understanding and experience well in advance of that required of an undergraduate or a student in a graduate diploma programme. Because the overall objectives of Master programmes are so different to those of undergraduate or postgraduate diplomas, existing subjects at undergraduate or postgraduate level may be unsuitable for offering as Master degree subjects. This point will be further elaborated upon later in this paper.

ASSESSMENT

As far as possible, assessment procedures should simulate the real thing. Bynner (1986) recommends that the preparation of students for professionally advanced work situations requires a demonstration of their ability to perform the kind of tasks that will be expected of them there. Opportunities must be given for students to demonstrate they can identify problems in their field of interest and formulate study plans or research strategies for their solution. Students also should be able to critically evaluate advanced literature in their field and display advanced professional and consultancy skills relevant to their occupation. The standard essay may well not be the most suitable form of assessment. New and innovatory assessment procedures will be required to challenge the student to demonstrate the required competencies. If examinations are necessary 'open book' or 'open question' (examination questions provided well before the date of sitting) should be considered because these can provide more effective

simulations than the traditional, unseen, 'closed book' examination. An example may help here. The second objective listed above under the Master of Business (International Business) overall objectives is:

"... interpret and respond to different cultural styles of personal communication."

The question we should ask is, how do we most effectively measure a student's ability to achieve this objective? One way would be to set a question in a 'closed book' examination such as:

"From your reading and experience, contrast the different cultural styles of personal communication you might expect to find when conducting negotiations with a business person from two different Asian countries. Explain how this knowledge might influence your approach to any negotiations."

There is nothing wrong with this question per se and some reasonable answers could be anticipated. If, however, the same question had been given to the students as an "open question" some ten weeks before the final examination students would have been able to use the question as a developmental learning activity. During these ten weeks students could properly read and prepare answers (a closer approximation to what might happen in the real world) or may have actually had the opportunity to conduct negotiations with two business persons from Asia and then had the time to analyse the effectiveness of their personal communication skills. Such an "open question" allows the student to demonstrate "process" skills more effectively.

It goes almost without saying that all assessment at the Master degree level should challenge students to demonstrate the higher cognitive skills of analysis, synthesis and evaluation.

TWO-WAY COMMUNICATION

With regard to the form of student support that master level students require it may not be sufficient to treat them in the same way as other external students. Mention has already been made of the potential of teleconferencing as a means of effectively establishing two-way communication but other methods should also be introduced such as:

- Attendance at a Residential School as early as possible in the programme to enable students to identify with the RMIHE, meet other Master degree students and appreciate early the course expectations.

- Attendance at two or more other residential schools to enable seminar presentations to take place, discussions about projects to occur and the completion of any assessment activities best completed in such an environment.

- The appointment at the initial Residential School of an academic counsellor responsible for providing individualised advice and assistance throughout the duration of the degree for the members of the incoming cohort.

- The use of the telephone tutorial for feedback on assignments. (Staff may need some training in effective telephone tutoring techniques.)

- The regular use of the telephone by the subject lecturer as an integrated, pre-scheduled component of two-way communication.

- Lecturers teaching in a Master degree subject should provide students with a definite timeslot when they will be available every week for incoming calls from their students.

- The use of computer based communications where possible.

Although Master degree students are expected to demonstrate a high level of independent learning they have communication needs that are very different to those of undergraduate students. Communication and discussion of issues should be an essential component of advanced study.

Frequent and meaningful lecturer-student dialogue on an individual basis must be encouraged.

LIBRARY RESOURCES

Winter and Cameron (1983) conducted a survey of external students' use of library facilities for the Commonwealth Tertiary Education Commission. they found that postgraduate students (which of course includes Master degree students) use libraries more than undergraduates as both borrowers and readers. Postgraduates also made greater use than undergraduates of photocopying services, cataloguing, library searches and inter-library loans. Clearly, proper and generous steps need to be taken well before the commencement of planned Master degrees to ensure that a comprehensive range of resources is readily available. Two members of the library staff at RMIHE have already been assigned the special role of providing for the needs of external students. As the new Master degrees become available it may be necessary to increase the staffing in this area and delegate a senior member of staff the specific role of maintaining a specialised high quality service to Master degree students. Exciting developments in library provision can also be expected as the National Computer Network SPEARNET develops:

- more economical links between institutions and the Australian Bibliographic Network;

- access to relevant bibliographic data with ability to retrieve from the database selective extracts, summaries, and textual material;

- access to the ever increasing number of monographs, journals and case materials produced in electronic form;

- rationalisation of library holdings; and

- provision of immediate interlibrary loan facilities.

(NACN, 1988)

USE OF EXISTING MATERIALS

So far this paper has stressed three main points. First, any subject offered to students, whatever the level, should broadly adhere to a set of learning principles such as those expressed by Gagne. Second, the broad objectives of Master degree programmes are different to those of baccalaureate degrees or graduate diplomas. Third, these differences will be reflected in the design of the learning materials and the methods of teaching and servicing external students at the Master degree level. The question that still remains only partly addressed however, is the extent to which existing undergraduate and graduate diploma external subjects may be used for Master degree coursework.

There is a great temptation with some fifty or so new subjects to be developed at the Master degree level to make use of existing undergraduate and/or graduate diploma subjects already designed specifically for use by external students. Such a move would represent a saving in time and energy and is clearly cost-saving also. Conceivably students need only express an interest in a certain aspect of a discipline and two existing subjects that closely approximate that interest could be despatched with perhaps a covering statement from the lecturer about assessment procedures. (Two subjects would presumably be necessary to make up the required eight unit value.)

Previous discussions regarding objectives at Master degree level and the subsequent instructional design implications should have convinced the reader, however, that such a cosmetic approach is unacceptable. Apart from being open to accusations of "doing it on the cheap" the resulting eight unit subject could be a mish-mash of unrelated materials originally designed to achieve quite different objectives. The only three occasions when existing undergraduate/graduate diploma external material could perhaps be used to support a Master degree programme are:

- as background study when a student has a particular identified weakness that needs rectifying before successfully proceeding,
- provision of Master degree qualifying work when a student's ability to cope is in doubt,
- as revision of material previously studied but since forgotten.

Subjects at Master degree level should be prepared to meet the special needs of advanced students. This involves the clear identification of expected student outcomes for each subject at the outset and the provision of content and delivery systems that allow students to fully realise these objectives. Whereas some of the existing material developed for undergraduate or graduate diploma students may usefully be incorporated in a revised format into sections of new Master degree subjects, over-reliance on such material would be educationally unsound and could even be considered a form of parisitism.

CONCLUSION

Given certain basic resources and facilities, regular and effective lecturer/student two-way communication, accessible library stock, residential opportunities and ingenuity in design so that objectives are attainable, external Master degree teaching of the highest standard can be achieved. The creation of innovative approaches to the design and delivery of new subjects based on Gagnerian learning principles should be an exciting challenge for all concerned. This can best be achieved if the content specialists and development officers experienced in instructional design cooperate fully from the outset in the creation of new Master Degree subjects.

REFERENCES

Australian Council on Awards in Advanced Education, Guidelines for the National Registration of Awards in Advanced Education, 4th Edition, AGPS, Canberra, 1986 pp 2-12.

Australian Council on Tertiary Awards, Guidelines for the National Registration of Awards, AGPS, Canberra, 1988 pp 15-16.

Bynner, J., "Masters Teaching in Education by Distance Methods", Distance Education, Vol 7, No 1, March 1986.

Gagne R.M. & Briggs L.J., Principles of Instructional Design, Toronto: Holt, Rinehart and Winston, 1979.

Meacham E.D. & Evans D.E., Distance Education: The Design of Study Materials, RMIHE, 1980.

Roberts D.W., Audio-teleconferencing, RMIHE, 1985.

School of Commerce, RMIHE, Course Proposal, Master of Business Administration (International Business) Degree, September 1988.

School of Education, RMIHE, M.Ed. Degree Modifications, Proposal presented to the Courses Committee, November 1988.

Spearnet, 'National Academic Computer Network', Newsletter No 1, AVCC/ACDP Steering Committee on Networking, December 1988.

White M.A., "Graduate degrees by external study: The Nova University programmes in Florida", Distance Education, Vol 1, No 2, September 1980.

Winter A. & Cameron M, "External Students and their libraries", a report of the study funded by the Evaluation and Investigations Programme of the Commonwealth Tertiary Education Commission, Geelong, Deakin University, 1983.

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